SUBMERGED ELECTRIC FLUID PUMP

TECHNICAL FIELD

The present invention relates to a fluid pump. More specifically, the present invention relates to a submergible electrically driven fluid pump for a transmission, transfer case or engine of a vehicle.

BACKGROUND OF THE INVENTION

In vehicle, engine and transmission designs today, many fluid pumps are used for pumping of fluids to engine, transmission systems and transfer cases. In the past, these pumps typically have been mechanical in many locations on the engine, such as the engine oil pump, for instance. Typically, it was believed that such pumps were critical to the operation of the vehicle and that mechanical operation of these pumps was more reliable than electrical pumps. Therefore, when designing transmissions or engines, for instance, it is necessary to design mechanical drives connected to the engine operating system, and provide attachments and porting for taking the oil from the oil pan and into the engine lubricating system. Mounting flanges are required for operative pumping of oil flow from the reservoir to the pump for pumping to the final destination. Inlet and outlet porting for the pump is typically contained in the pump housing, taking up valuable real estate.

In recent years, vehicle designs have advanced in many areas. For instance, electrical components have become increasingly more reliable. This has led to more usages of electrical components in vehicles. Weight considerations, specifically reduction in weight, has become increasingly important. This has led to a desire to

simplify operations in design and manufacture, and use lighter weight components wherever possible. Additionally, size and space saving considerations have required many design changes in vehicles today. Also, mechanical operation does not readily allow for or demand pumping operations that are desirable in today's operating environment. Therefore, it is desirable to provide a pumping apparatus which will not require mechanical operation and which requires little or no design changes or additional space for simplifying of the pumping of oil or other fluids in today's vehicles.

SUMMARY OF THE INVENTION

Thus, in accordance with the present invention there is provided a fluid pump for pumping of fluid of a vehicle having a reservoir containing fluid therein. The pump includes a housing having a pump element therein. The housing and pump element are attached to an accompanying mounting face in the transmission or oil sump. The pump includes intake and exit ports therein for receiving fluid from the reservoir and pumping fluid to an exterior location.

The pump of the present invention allows an electrically driven fluid pump to be submerged in the fluid reservoir for pumping of the fluid. In many cases, the pump in accordance with the present invention can be mounted to the existing plate used for pump porting.

A further understanding of the present invention will be had in view of the description of the drawings and detailed description of the invention, when viewed in conjunction with the subjoined claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exploded view of the pump elements in accordance with the present invention; and

Figure 2 is a sectional view of the pump of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In accordance with the present invention, there is provided a fluid pump, generally indicated at 10, for pumping fluid of a vehicle having a reservoir. The pump 10 includes a housing 12, including a pumping element 14 therein. A pump mounting face 16 is provided for mounting of the pump in the reservoir 18. Pump mounting face 16 preferably is a transmission case, valve body, engine block or the like, with an inlet.

In a preferred embodiment, pump mounting face is external of the pump and uses existing oil pan or transmission fixtures. This provides for the necessary amount of oil for the inlet without using extra space in the pump housing, therefore, using less space inside the oil pan or transmission. In a preferred embodiment, an existing valve manifold in a transmission has worm trails 15 configured to provide inlet and outlet porting. A porting plate 19 (which in a preferred embodiment is a valve manifold cover) is provided for providing intake on outlet porting holes into the pumping chamber 17. Alternatively, the plate 19 and pump housing 12 could be integral with one another.